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Title: **Open Wireless Architecture for Fourth Generation Mobile Communications**
Application No.   **10/709,485**
Art Unit: **2617**
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Dear Mr. Fox and Mr. Appiah:

In my official response to your office action on October 18th, 2006, I enclosed "The Amendment to the Claims" at the end of the response. However, when I checked the USPTO website today, this "Amendment to the Claims" is missing in PAIR.

I do not know why it got lost in your database, and therefore resend this part of "Amendment to the Claims" to make the response complete.

I hope this time everything is OK, and please let me know if any questions.

Yours truly,

11/6/06

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Amendment to the Claims

Claim 1 (Currently Amended)

An open wireless architecture (OWA) for fourth generation mobile communications said system comprising:

    a) a wireless communication terminal device supporting various different wireless ~~standards~~ (air interfaces) in the same device with same unique identifier and capable of communicating with other devices, systems or networks through a wireless medium ~~or over the air network~~,

    b) an advanced computer system equipped with full networking facilities to access various different backbone networks <u>either</u> through wireline networking interfaces or ~~sometimes~~ through broadband wireless access systems,

    c) an advanced transceiver system supporting various different air interfaces to interconnect said wireless communication terminal device~~, etc~~ through the air link,

    d) said transceiver system connect<u>ing</u> to said computer system to construct the base-station as a whole,

    e) said wireless terminal device ~~can also~~ connect<u>ing</u> to different wireline networks through its networking interfaces in the said wireless terminal device,

    f) said base-station ~~can~~ connect<u>ing</u> to other base-station either over the wireline networks or over broadband wireless access system through said computer system, or by over-the-air networks through said transceiver system,

    g) said wireless terminal device ~~can also~~ connect<u>ing</u> to other wireless terminal device through the air link in an ad-hoc mode ~~in case of special situations~~.

Claim 2 (Currently Amended)

The Open Wireless Architecture (OWA) for fourth generation mobile communications of claim 1 wherein: both said wireless terminal device and said base-station further comprising:

    a) an open processing engine ~~to~~ process<u>ing</u> the signals and protocols of various different air-interfaces ~~(including user-defined air-interface)~~ for over-the-air networking and transmission,

    b) a reconfigurable digital converter ~~to~~ transform<u>ing</u> the received signals to the digital base-band signals and vice verse, and connect<u>ing</u> to said open processing engine,

    c) a programmable radio frequency (RF) module and smart antenna processing module of different frequencies ~~to~~ support<u>ing</u> different air-interfaces, and connect<u>ing</u> to said digital converter,

    d) a software definable module (SDM) containing parameters, algorithms and protocols~~,~~ ~~etc~~of some wireless air-interfaces to be stored in an external memory card or downloaded from networks,

    e) an open wireless BIOS (basic input/output system) structure capable of providing the common and open interfaces to said processing engine, said digital converter, said RF module and said SDM~~, etc~~.

Claim 3 (Currently Amended)

The Open Wireless Architecture (OWA) for fourth generation mobile communications of claim 1 wherein: both said wireless terminal device and said base-station further comprising:

a) a system software module to supporting dynamic spectrum management, spectrum sharing and resource management to increase spectrum efficiency and optimize the system performance,

b) a convergence layer module to convergeing wireline and wireless networks and services, as well as transmission convergence, etc,

c) a configuration management module to enableing flexible system re-configuration when wireless air-interfaces changeing, wireline networking changesing or system settings changeing, etc.

Claim 4 (Currently Amended)

A system as recited in claim 1 wherein said wireless terminal device capable of system software running upon the system hardware directly while the application soft-ware executing on the real-time OS (operating system) standards through said open wireless BIOS.

Claim 5 (Currently Amended)

A system as recited in claim 2 wherein said open processing engine decodes, de-channelizes and demodulates the base-band channel signals and control signals of said various air-interfaces into detailed digital signaling, traffic and control information, and vice verse.

Claim 6 (Currently Amended)

A system as recited in claim 1 wherein said base station can be reconfigured and re-programmed as wireless router, mobile soft switch or wireless gateway, etc.

Claim 7 (Currently Amended)

A system as recited in claim 1 wherein said base station can be reconfigured to be portable and/or mobile as well for military applications or special industrial applications. In that case, that the said computer system connectsing to the backbone networks through said broadband wireless access systems instead of said wireline networking interfaces.

Claim 8 (Original)

A system as recited in claim 1 wherein said wireless terminal device and said base-station can communicate each other over said various different air interfaces including time-division multiple access (TDMA), code-division multiple access (CDMA), frequency-division multiple access (FDMA) or other user-defined interfaces.

Claim 9 (Original)

A method as recited in claim 8 detecting said various different air-interfaces for said wireless terminal device and said base-station, said method comprising:

a) performing initial channel processing from the received signals, or

b) scanning frequency carrier from the received signals, or

c) performing different decoding scheme from the received signals, or

d) performing different demodulation scheme from the received signals, or

e) running user-defined detecting technologies.

Claim 10 (Currently Amended)

A method as recited in claim 1 connecting said transceiver system and said computer system through open software structures, comprising:

   a) open operating systems supporting Windows, Linux or user-defined,
   b) open resource management covering spectrum, bandwidth, channels, capacity, processors, power, storage and services, etc,
   c) open communication application software enabling user-friendly programming and services,
   d) common objects library and functional components defining the converged processing elements,
   e) open configuration management supporting system reconfiguration in base-band parts, RF parts, antenna parts and networking parts, etc.

Claim 11 (Currently Amended)

A system as recited in claim 2 wherein said open wireless BIOS defining the basic interface structure for the said various different air-interfaces/wireless standards (either common standards or user-defined), said standardsair-interfaces switching, said functional modules as well as switching between internal and/or external said modules, etc.

Claim 12 (Currently Amended)

A method as recited in claim 2 providing a smart antenna processing module for said OWA system, said method comprising:

   a) using antenna arrays to process radio signals in both space, not onlyand time, to improve performance in presence of wireless fading and interference,
   b) using beamforming algorithm to increase received signal-over-noise-rate (SNR) for desired directions,
   c) using diversity algorithm to combat fading in order to work at less SNR,
   d) using interference mitigation method to maximally reuse the channel frequencies,
   e) using spatial multiplexing algorithms to increase data speeds, for example, MIMO (multiple-in and multiple-out), etc (MIMO).

Claim 13 (Currently Amended)

A system as recited in claim 2 wherein said software definable module in said wireless terminal device can be stored in or installed from said external memory card (or SIM card), or downloaded from any available networking facilities of said wireless terminal device.

Claim 14 (Currently Amended)

A method as recited in claim 3 providing a convergence layer module for said OWA system, said method comprising:

   a) open service convergence including transparent integrated services across both wireline and wireless networks, etc,
   b) open transport convergence including IP (internet protocol) (IP) enterprise convergence and All-IP end-to-end convergence, etc,
   c) open transmission convergence including adaptive modulation, adaptive coding and adaptive equalization, etc.

Claims 15-20 (Canceled)